the height, the leafy part at the top of the caudex is included, along with the tub in which the plant is growing:—

Acrocomia aculeata, 38 feet.
Areca triandra, 19 „
Caryota urens, 43 „
The frond is 4 feet 9 inches beyond the roof.
Chamærops humilis var. elata, 20 feet.
Cocos nucifera . . 18 „
Euterpe montana . . 38 „
Frond about 2 feet beyond the roof.
Livistona chinensis, 40 feet.
Fronds bent down by the roof of the house.
Sagus Rumphii, 43 feet.
Fronds about 10 inches beyond the roof.
Seaforthia elegans, 22 feet.

Several of them are between fifty and sixty years old.

Dr. Balfour gave an account of a botanical trip to Ireland in August 1852 with some of his pupils.

MISCELLANEOUS.

On the Fecundation of the Fucaceæ. By M. Gustave Thuret.

The physiological functions of the antheridia in the higher Cryptogamia appear to be now pretty well established. It is no longer doubted that they are fecundating organs, and that the antherozoïds which they contain are the immediate agents of fecundation, although the action of these upon the female organ or archegonium has not yet been observed.

But as regards the lowest Cryptogamia (Algæ, Fungi, Lichens) the question is much less advanced. The existence of antheridia in these vegetables is a recent discovery, which careful researches will probably extend to all the families of this vast group, but which in the author's opinion cannot be established with certainty until the fecundating power of these organs upon the reproductive apparatus shall be demonstrated.

The author availed himself of his stay at Cherbourg to endeavour to resolve this question as regards the organs designated by M. Decaisne and himself as the antheridia of the Fucaceæ. He considers that the results of his researches furnish the first direct proof of the existence of true sexuality in the lower Cryptogamia.

With this view he has studied the phænomena presented by artificial impregnation. Several species of Fucaceæ are diœcious; when these plants are placed for some time in a damp atmosphere, the spores and the antheridia are pushed out on the surface of the fronds in great numbers; they are then easily collected and deposited in vessels filled with sea-water, or simply in a drop of water on a slip of glass which is protected from evaporation.

When these organs are kept in separate vessels, the following phænomena are observed. The antheridia immediately emit their antherozoïds, which move about with the greatest vivacity; these movements are frequently continued till the next day, diminishing gradually in intensity; on the third day decomposition commences. The spores remain for about a week without sensible alteration; they then also decompose without further development. Sometimes phænomena resembling germination are exhibited; some of them emit irregular prolongations, but no septa are formed; the evolution of the spores proceeds no further; they become decomposed like the others. In fact, germination never takes place in spores which are deprived of the contact of the antherozoïds.

But when the spores and the antheridia are mixed together, the spore becomes invested with a very distinct membrane in the course of a day or two, a septum is formed which divides the spore into two hemispheres, and a sensible elongation begins to appear on a point of the circumference. The development of the young plant then proceeds rapidly; the septa become more numerous, the elongation increases, and in about ten days the spore is converted into a small ovoid, cellular mass, of a brown colour, supported on a transparent radicle.

If the experiment has been performed on a slip of glass kept constantly near a window in the same position, it will be seen that nearly all the radicles are turned towards the interior of the room, or from the light.

The fecundating action of the antherozoïds upon the spores is therefore an incontestable fact. When they are in considerable quantity, they frequently attach themselves to the spores, crawl in a manner upon their surface, and communicate to them, by means of their vibratile cilia, a rotatory movement which is often very rapid. Nothing is more curious than the appearance of these large brownish spheres rolling in all directions amongst the crowds of antherozoïds which surround them. This phænomenon, however, does not appear to be necessary for the fecundation of the spores. When all movement has ceased and germination has commenced, the remains of decomposed antherozoïds frequently surround the spore without being immediately in contact with it; a layer of mucilage separates them from the membrane of the spore and forms a transparent halo around it.

The author endeavoured to fecundate the spores of *Ozothallia vulgaris* (*Fucus nodosus*, Linn.) with the antherozoïds of *Fucus serratus* and *vesiculosus*, and *vice versâ*. But although the spores and antherozoïds of these three species present the most complete resemblance, and although the antherozoïds attach themselves in great numbers to the spores, causing them to move with great vivacity, no grm nation took place. Nor did he succeed in fecundating the spores of *Fucus serratus* with the antherozoïds of *Fucus vesiculosus*. But on reversing this experiment, some of the spores of the *F. vesiculosus* germinated. He does not venture to conclude from this that a hybrid fecundation is possible, but nevertheless calls attention to the

fact, that whilst the *Ozothallia* and the *Fucus serratus* are very constant in form, the *F. vesiculosus* is extremely polymorphous.

In the higher Cryptogamia the phænomenon of fecundation presents two principal modifications. In the Mosses and Characeæ it takes place in adult plants, and appears to be necessary for the formation of the reproductive bodies; it must consequently be repeated every time that the plant fructifies, and in this respect approaches the process in the phanerogamous plants. In the Equisetaceæ, the Ferns, the Lycopodiaceæ, and the Rhizocarpeæ, fecundation takes place some time after the germination of the spore; its result is the development of the frond which will fructify every year without fresh fecundation. The Fucaceæ present a third modification of the phænomenon, which resembles the second rather than the first, and which has perhaps still more analogy with what takes place in the case of animals. Here it is upon the spore itself that the fecundating action of the antherozoïds is exerted, and it is only in consequence of this contact that the spore is developed into a frond capable of fructifying every year without fresh fecundation.—*Comptes Rendus*, April 25, 1853.

TIME OF SPAWNING OF BRITISH CRUSTACEA.

To the Editors of the Annals of Natural History.

Weymouth, June 18, 1853.

Gentlemen,—I enclose you an addition to my list of the "Time of Spawning of British Crustacea" which appeared in the 'Annals of Nat. Hist.' vol. viii. p. 501.

I wish to draw the attention of your readers to an error in that paper, in which *Crangon bispinosus* is enumerated instead of *Crangon trispinosus*. I have not yet been able to obtain *C. bispinosus*. I am at a loss to conceive how this error could have occurred, as my notes are correct.

I have now succeeded in fixing the dates of carrying spawn of *thirty-eight* species of British Crustacea, and I have myself obtained at this place fifty-four species, and fully expect to add to that number.

Amongst my latest captures are *Crangon spinosus*, *Hippolyte Whitei* (mihi), *Mysis chameleon*, *Mysis Griffithsiæ*, and one or two species I cannot at present make out.

My dredger is a very clever fellow, and would be pleased to supply anything he might obtain when dredging.

I am, Gentlemen, yours obediently,

William Thompson.

Species.	Date when found carrying ova.	General Remarks.
Achæus Cranchii	Aug. 18, 1852.	I dredged two in six fathoms, shingle and weedy bottom: one female had two single ova; they are of a deepish yellow colour.